WHAT IS CLAIMED IS:

1. A smart card for storing a digitally compressed image, the image containing image data consisting of a plurality of scan lines of pixels with scalar values, comprising:

image data filtered by evaluation of the scalar values of individual pixels in the image with respect to neighboring pixels, said image data being statistically encoded by dividing the image into an array of blocks of pixels, and each block of pixels being encoded into a fixed number of bits that represent the pixels in the block; and

a memory storing said image data.

2. The smart card of Claim 1, wherein said memory comprises a programmable microchip.

3. The smart card of Claim 1, wherein said image data is filtered by evaluating each said individual pixel as a target pixel and a plurality of pixels in close proximity to the target pixel to determine an output value for the target pixel.

4. The smart card of Claim 3, wherein said image data is filtered by evaluating a sequence of five pixels, including two pixels on either side of the target pixel and the target pixel itself, for each said target pixel.

5. The smart card of Claim 4, wherein said image data is filtered by determining an average of the data for a window of the pixels immediately surrounding the target pixel for those pixels surrounding the target pixel that are within a specified

range of values, according to the following protocol: if all five pixels are within the specified range, the output target pixel is determined to be the average of the four pixels in a raster line, two on each side of the target pixel; if the two pixels on either side are within a specified range and both sides themselves are within the range, the filtered output target pixel data is determined to be the average of the two pixels on each side of the target pixel; if the two pixels on either side of the target pixel and the target pixel itself are within a specified range, and the other two pixels on the other side are not within the specified range, the output target pixel is determined to be the average of the two neighboring pixels closest in value to the target pixel values and that fall within the specified range; if the five pixels are all increasing or decreasing, or are within a specified range, the output target pixel is determined to be the average of two pixels on whichever side of the target pixel is closest in value to the target pixel; and if the five pixels in the window do not fit into any of the prior cases, the output target pixel is unchanged.

6. The smart card of Claim 1, wherein said image data is statistically encoded by dividing the image into an array of 4x4 squares of pixels, and encoding each 4x4 square of pixels into a fixed bitlength block containing a central color value, color dispersion value, and a selection map that represent the sixteen pixels in the block.

7. The smart card of Claim 1, wherein said image data is converted to the YCrCb color space.

8. The smart card of Claim 7, wherein said image data is converted to the YCrCb color space by converting color image data from the RGB color space.

9. The smart card of Claim 8, wherein said image data is converted to the YCrCb color space by lookup tables of selected color values for color space conversion.

10. The smart card of Claim 9, wherein said image data is converted to the YCrCb color space by nine 256-entry one-byte lookup tables containing the contribution that each R, G and B make towards the Y, Cr and Cb components.

11. The smart card of Claim 6, wherein each said block contains a central color value and a color dispersion value.

12. The smart card of Claim 11, wherein said image data is statistically encoded by determining a first sample moment of each block as the arithmetic mean of the pixels in the block, and said central color value of each said block is set to the arithmetic mean from the first sample moment of the pixels in the block.

13. The smart card of Claim 6, wherein said image data is statistically encoded by determining a first sample moment of each block as the arithmetic mean of the pixels in the block, determining a second sample moment of the pixels in the block, and determining said selection map from those pixels in the block having values lighter or darker than the first sample moment.

14. The smart card of Claim 6, wherein said image data is statistically encoded by determining a first sample moment of each block as the arithmetic mean of the pixels in the block, determining a second sample moment of the pixels in the block, and determining said selection map from those pixels in the block having values

lighter or darker than the average of the lightest and darkest pixels in the block.

15. The smart card of Claim 1, wherein said image data is statistically encoded by dividing the image into an array of 4x4 squares of pixels, and multi-level encoding the central color values of each 4x4 square of lower level blocks.

16. The smart card of Claim 15, wherein multi-level encoding is repeated until from four to fifteen blocks remain on each axis of a top level of blocks.

17. The smart card of Claim 16, wherein said top level of blocks is reduced to residuals from a fixed background color.

18. The smart card of Claim 15, wherein each successive lower level block is reduced to the residuals from the encoded block on the level above.

19. The smart card of Claim 15, wherein the pixel values are reduced to the residuals from the encoded level one blocks.

20. The smart card of Claim 1, wherein said image data is statistically encoded by determining a classification of each said block, quantifying each said block, and compressing each said block by codebook compression using minimum redundancy, variable-length bit codes.

21. The smart card of Claim 20, wherein each said block is classified according to a plurality of categories.

22. The smart card of Claim 20, wherein each said block is classified in one of four categories: null blocks exhibiting little or no change from the higher level or previous frame, uniform blocks having a standard deviation less than a predetermined threshold, uniform chroma blocks having a significant luminance component to the standard deviation, but little chrominance deviation, and pattern blocks having significant data in both luminance and chrominance standard deviations.

23. The smart card of Claim 20, wherein the number of bits to be preserved is determined for each component of the block after each said block is classified.

24. The smart card of Claim 23, wherein a quantizer defining the number of bits to be preserved is determined for each component of the block according to the classification of the block to preserve a desired number of bits for the block.

25. The smart card of Claim 23, wherein the number of bits for the Y and Cr/Cb components of the blocks to be preserved are determined independently for each classification.

26. The smart card of Claim 25, wherein all components of each said block are preserved for pattern blocks.

27. The smart card of Claim 25, wherein the mean luminance and chrominance, standard deviation luminance, and a selection map are preserved for uniform chroma blocks.

28. The smart card of Claim 25, wherein all three color components of the central color value are preserved for uniform blocks.

29. The smart card of Claim 25, wherein the run length of null blocks is recorded without preserving components of the null blocks.

30. The smart card of Claim 22, wherein the texture map of the block is matched with one of a plurality of common pattern maps for uniform chroma and pattern classified blocks.

31. The smart card of Claim 1, wherein a datastream is stored in level order in the smart card.

32. The smart card of Claim 1, wherein a datastream is stored in block order in the smart card.

33. The smart card of Claim 1, compressed residuals are added between input pixel data and level-one decoded blocks to thereby provide loss-less digital compression of the image.

34. A smart card for storing a digitally compressed color image, the color image containing color image data consisting of a plurality of scan lines of pixels with color values, comprising:

color image data filtered by evaluation of the color values of individual pixels in the color image with respect to neighboring pixels, said image data being statistically encoded by dividing the color image into an array of blocks of pixels, and

each block of pixels being encoded into a fixed number of bits that represent the pixels in the block; and

a memory storing said color image data.

35. The smart card of Claim 34, wherein said memory comprises a programmable microchip.

36. The smart card of claim 34, wherein said digital color image data is converted to the YCrCb color space.

37. The smart card of claim 36, wherein said digital color image data is converted to the YCrCb color space from the RGB color space.

38. The smart card of claim 36, wherein said digital color image data is converted to the YCrCb color space by lookup tables of selected color values for color space conversion.

39. The smart card of claim 38, wherein said digital color image data is converted to the YCrCb color space by nine 256-entry one-byte lookup tables containing the contribution that each R, G and B make towards the Y, Cr and Cb components.

40. The smart card of Claim 35, wherein said digital color image data is filtered by evaluating each said individual pixel as a target pixel and a plurality of pixels in close proximity to the target pixel to determine an output value for the target pixel.

41. The smart card of Claim 40, wherein said digital color image data is filtered by evaluating a sequence of five pixels, including two pixels on either side of the target pixel and the target pixel itself, for each said target pixel.

42. The smart card of Claim 41, wherein said digital color image data is filtered by determining an average of the data for a window of the pixels immediately surrounding the target pixel for those pixels surrounding the target pixel that are within a specified range of values, according to the following protocol: if all five pixels are within the specified range, the output target pixel is determined to be the average of the four pixels in a raster line, two on each side of the target pixel; if the two pixels on either side are within a specified range and both sides themselves are within the range, the filtered output target pixel data is determined to be the average of the two pixels on each side of the target pixel; if the two pixels on either side of the target pixel and the target pixel itself are within a specified range, and the other two pixels on the other side are not within the specified range, the output target pixel is determined to be the average of the two neighboring pixels closest in value to the target pixel values and that fall within the specified range; if the five pixels are all increasing or decreasing, or are within a specified range, the output target pixel is determined to be the average of two pixels on whichever side of the target pixel is closest in value to the target pixel; and if the five pixels in the window do not fit into any of the prior cases, the output target pixel is unchanged.

43. The smart card of Claim 35, wherein background in the image being compressed is replaced with a scalar value, in order to reduce noise in the image, and to increase the visual quality of the compressed image.

44. The smart card of Claim 43, wherein background in the image being

compressed is replaced with a scalar value by setting an initial chromakey mask and delta values.

45. The smart card of Claim 44, wherein the initial chromakey mask is determined by the pixels in the input image that are near the chromakey value.

46. The smart card of Claim 45, wherein three delta components describe a rectangular region in YCrCb color space.

47. The smart card of Claim 45, wherein one delta component describes a spherical region in YCrCb color space.

48. The smart card of Claim 45, wherein three delta components describe a hollow cylindrical segment in HSV color space.

49. The smart card of Claim 44, wherein artifacts are removed from said initial chromakey mask.

50. The smart card of Claim 49, wherein the artifacts are removed by

a) initially determining said background mask set of pixels;

b) removing pixels from said mask set that have less than a predetermined threshold of neighboring pixels included in said mask set;

c) adding pixels to said mask set that have more than a predetermined threshold of neighboring pixels included in said mask set; and

repeating steps b) and c) a plurality of times.

51. The smart card of Claim 49, wherein the artifacts are removed by applying a sliding linear filter of five pixels once horizontally and once vertically to adjust a plurality of target pixels of said initial chromakey mask, and adjusting each target pixel to be included in the chromakey mask if the target pixel is initially not included in the chromakey mask, the pair of pixels on either side of the target pixel are in the chromakey mask, and the target pixel is not near an edge; adjusting each target pixel to be included in the chromakey mask if the target pixel is initially not included in the chromakey mask, and the two adjacent pixels on either side of the target pixel are included in the chromakey mask; adjusting each target pixel to be included in the chromakey mask if the target pixel is initially not included in the chromakey mask, and if three of the adjacent pixels a distance of two or less pixels away from the target pixel are included in the chromakey mask; adjusting each target pixel to be excluded from the chromakey mask if the target pixel is initially included in the chromakey mask, and if both pairs of pixels on either side of the target pixel are not included in the chromakey mask.

52. The smart card of Claim 34, wherein said image data is statistically encoded by dividing the color image into an array of 4x4 squares of pixels, and encoding each 4x4 square of pixels into a fixed number of bits containing a central color value, color dispersion value, and a selection map that represent the sixteen pixels in the block.

53. The smart card of Claim 52, wherein each said block contains a central color value and a color dispersion value.

54. The smart card of Claim 53, wherein said image data is statistically encoded by determining a first sample moment of each block as the arithmetic mean

of the pixels in the block, and said central color value of each said block is set to the arithmetic mean from the first sample moment of the pixels in the block.

55. The smart card of Claim 53, wherein a second sample moment of the pixels in the block is determined, and said color dispersion value of each said block is determined by determining the standard deviation from said first and second sample moments.

56. The smart card of Claim 53, wherein said image data is statistically encoded by determining a first absolute moment by determining an average of the difference between said pixel values and said first sample moment, and wherein said color dispersion value is set to said first absolute moment.

57. The smart card of Claim 53, wherein said image data is statistically encoded by determining a first sample moment of each block as the arithmetic mean of the pixels in the block, determining a second sample moment of the pixels in the block, and determining said selection map from those pixels in the block having values lighter or darker than the first sample moment.

58. The smart card of Claim 53, wherein said image data is statistically encoded by determining a first sample moment of each block as the arithmetic mean of the pixels in the block, determining a second sample moment of the pixels in the block, and determining said selection map from those pixels in the block having values lighter or darker than the average of the lightest and darkest pixels in the block.

59. The smart card of Claim 54, wherein said image data is statistically

encoded by encoding two levels of blocks of each 4x4 square of pixels, said two levels including level one blocks and level two blocks, and wherein said level two blocks are encoded from the central color values of the level one blocks.

60. The smart card of Claim 59, wherein said level two blocks are reduced to residuals from a fixed background color.

61. The smart card of Claim 59, wherein said level one blocks are reduced to residuals from decoded level two blocks.

62. A smart card for storing a digitally compressed color image, the color image containing image data consisting of a plurality of scan lines of pixels with scalar values, comprising:

image data filtered by evaluation of the scalar values of individual pixels in the image with respect to neighboring pixels;

said image data being statistically encoded by dividing the image into an array of blocks of pixels, and each block of pixels being encoded into a fixed number of bits that represent the pixels in the block by classifying each said block, quantifying each said block, and compressing each said block by codebook compression using minimum redundancy, variable-length bit codes; and

a memory storing said color image data.

63. The smart card of Claim 62, wherein each said block is classified according to a plurality of categories.

64. The smart card of Claim 63, wherein each said block is classified in one of four categories: null blocks exhibiting little or no change from the higher level or previous frame, uniform blocks having a standard deviation less than a predetermined threshold, uniform chroma blocks having a significant luminance component to the standard deviation, but little chrominance deviation, and pattern blocks having significant data in both luminance and chrominance standard deviations.

65. The smart card of Claim 62, wherein the number of bits for the Y and Cr/Cb components of the blocks to be preserved are determined independently for each classification.

66. The smart card of Claim 65, wherein all components of each said block are preserved for pattern blocks.

67. The smart card of Claim 65, wherein all components of a central color, standard deviation luminance, and a selection map, are preserved for uniform chroma blocks.

68. The smart card of Claim 65, wherein all three color components of the central color value are preserved for uniform blocks.

69. The smart card of Claim 65, wherein the run length of null blocks is recorded without preserving components of the null blocks.

70. The smart card of Claim 62, wherein the texture map of the block is matched with one of a plurality of common pattern maps for uniform chroma and pattern classified blocks.

71. The smart card of Claim 62, wherein said step of compressing each said block by codebook compression comprises selecting codes from multiple codebooks.

72. A smart card for storage of a digitally compressed image, comprising:

a datastream of image data stored in block order, the image data consisting of a plurality of scan lines of pixels with scalar values, the image data filtered by evaluating the scalar values of individual pixels in the image with respect to neighboring pixels, and the image data statistically encoded by dividing the image into an array of blocks of pixels, and encoding each block of pixels into a fixed number of bits that represent the pixels in the block.

73. The smart card of Claim 72, wherein datastream of image data is stored in a block order to first process those portions of the image that are most important to facial identification.

74. The smart card of Claim 72, wherein said block order provides a circle group layout.

75. The smart card of Claim 74, wherein the corners of the image are truncated.

76. The smart card of Claim 72, wherein said block order provides an oval group layout.

77. The smart card of Claim 76, wherein the corners of the image are truncated.

78. The smart card of Claim 72, wherein said block order provides a bell shaped group layout.

79. The smart card of Claim 78, wherein the corners of the image are truncated.

80. The smart card of Claim 72, wherein said blocks are divided into groups.